

What is claimed is:

1. An X-ray CT apparatus, comprising:

at least one X-ray irradiation source configured to irradiate X-rays to a volume of interest;

at least one X-ray detector including a plurality of detection element segments configured to detect the X-rays penetrated through the volume of interest;

at least one collimator configured to create an opening that is movable at least in a slice direction and a channel direction;

at least one image processing part configured to generate volume data from the detected X-rays and to extract a portion of the volume data corresponding to the volume of interest;

at least one controller configured to set the opening of the at least one collimator to a second opening size to irradiate a second scanning range corresponding to the portion of the volume data and configured to perform a second scan of the second scanning range; and

at least one reconstruction part configured to reconstruct image data based on data collected by the second scan.

2. The X-ray CT apparatus according to claim 1, wherein the at least one controller is configured to set the opening of the collimator to a first opening size that is wider than the second opening size and to perform a first scan.

3. The X-ray CT apparatus according to claim 2, wherein the amount of the X-rays used on the first scan is lower than an amount of the X-rays used in the second scan.

4. The X-ray CT apparatus according to claim 2, wherein:

the first scan includes a helical scan,

the second scan includes a helical scan, and

a helical pitch of the second scan is shorter than a helical pitch of the first scan.

5. The X-ray CT apparatus according to claim 2, wherein a number of the plurality of detection element segments used in the second scan is fewer than a number of the plurality of detection element segments used in the first scan.

6. The X-ray CT apparatus according to claim 2, wherein the at least one reconstruction part compensates external data of the second scanning range with data collected by the first scan.

7. The X-ray CT apparatus according to claim 6, wherein the external data is collected during the second scan.

8. The X-ray CT apparatus according to claim 6, wherein the external data is collected based on an X-ray detected by detection element segments other than detection element segments used in the second scan.

9. An X-ray CT apparatus, comprising:

at least one X-ray irradiation source configured to irradiate X-rays to a volume of interest;

at least one X-ray detector including a plurality of detection element segments configured to detect the X-rays penetrated through the volume of interest;

at least one collimator configured to create an opening that is movable at least in a slice direction and a channel direction;

at least one image processing part configured to generate volume data from the detected X-rays and to extract a portion of the volume data corresponding to the volume of interest;

at least one reconstruction part configured to reconstruct image data based on data collected by a second scan,

wherein the at least one collimator comprises,

a plurality of movable collimator blades configured to create the opening,

and

a plurality of auxiliary blades configured to create a slit corresponding to detection element segments other than detection element segments corresponding to the opening.

10. The X-ray CT apparatus according to claim 9, wherein:

the plurality of collimator blades creates the opening at a center part;

the plurality of the auxiliary blades create the slit on at least one side part while blocking a central portion of at least one of the X-rays.

11. An X-ray CT apparatus, comprising:

at least one X-ray irradiation source configured to irradiate X-rays to a volume of interest;

at least one collimator including a first opening configured to transmit the X-rays and a second opening that is more distant than the first opening from a center of the X-rays in both slice and channel directions;

at least one X-ray detector including a plurality of detection element segments configured to detect the X-rays that pass through at least one of the first opening and the second opening and that penetrate through the volume of interest; and

at least one reconstruction part configured to reconstruct image data based on data collected using the X-rays detected by the at least one X-ray detector.

12. The X-ray CT apparatus according to claim 11, wherein the first opening is wider than the second opening in the slice direction.

13. The X-ray CT apparatus according to claim 11, wherein the second opening includes a plurality of openings in the channel direction.

14. The X-ray CT apparatus according to claim 11, wherein the first opening is adjacent to the second opening in the slice direction.

15. The X-ray CT apparatus according to claim 11, wherein the first opening is separated from the second opening in the slice direction by at least one collimator blade.

16. The X-ray CT apparatus according to claim 11, wherein the image data reconstructed by the reconstruction part includes:

heart image data based on the X-rays that pass through the first opening; and  
peripheral image data around the heart image data based on the X-rays that pass through the second opening.

17. The X-ray CT apparatus according to claim 11, wherein the X-ray detector includes approximately 64 detection element segments in the slice direction.

18. The X-ray CT apparatus according to claim 17, wherein the first opening is created such that the X-rays which pass through the first opening are irradiated to approximately 16 detection element segments.

19. The X-ray CT apparatus according to claim 17, wherein the second opening is created such that the X-rays which pass through the second opening are irradiated to approximately 4 detection element segments.

20. The X-ray CT apparatus according to claim 11, wherein a width of the plurality of detection element segments in the slice direction is approximately 0.5 mm.

21. A method for reconstructing image data based on data collected by an X-ray CT apparatus that comprises at least one X-ray irradiation source configured to irradiate X-rays to

a volume of interest, at least one collimator including a first opening through which the X-rays pass and a second opening that is more distant than the first opening from a center of the X-rays in both slice and channel directions, and at least one X-ray detector including a plurality of detection element segments configured to detect the X-rays that pass through at least one of the first opening and the second opening and that penetrate through the volume of interest, the method comprising:

- reconstructing image data around the volume of interest based on the X-rays that pass through the first opening; and

- reconstructing peripheral image data around the image data based on the X-rays that pass through the second opening.